

## ABSTRACT OF THE DISCLOSURE

An optical sensor has a sensor compensation to compensate for sensor degradation due to airborne contaminations in the operating environment. For example, in a thermal ink jet printing environment, the thermal ink jet operation produces misting or splashing of the thermal ink jet droplets, causing a gradual degradation of the sensor sensitivity due to a surface accumulation of the ink jet droplets. The optical sensor device includes an optical emitter emitting an optical signal according to an emitter input, an optical detector disposed to detect the optical signal and output a detector output having an output level according to the detected optical signal, a variable attenuator having an adjustable attenuation setting, and a controller adjusting the attenuation setting of the variable attenuator. During an adjustment operation, the controller determines the attenuation setting at which the output level of the detector output exceeds a predetermined value, and accordingly sets the variable attenuator to operate the detector output at an output level exceeding the predetermined value by a margin. Compensations for the optical emitter and the optical detector are disclosed, including the use of a variable pulse-width modulated signal.